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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/724,403	11/27/2000	Shinji Maekawa	07977/258001/US4448	7575

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EXAMINER

HUYNH, YENNHU B

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 11/04/2002

7

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 09/724,403	<b>Applicant(s)</b> MAEKAWA, SHINJI	
	<b>Examiner</b> Yennhu B Huynh	<b>Art Unit</b> 2813	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION. ur

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2002.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-59 is/are pending in the application.
- 4a) Of the above claim(s) 10-19 and 21-59 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
 If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) ☐ All   b) ☐ Some \* c) ☒ None of:  
     1. ☒ Certified copies of the priority documents have been received.  
     2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
     3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
 \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
 a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

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## **DETAILED ACTION**

### ***Election/Restrictions***

Applicant's election without traverse of claims 1-9 & 20 in Paper No. 6 is acknowledged.

### ***Priority***

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in JP 11-336850 on 11/28/2000. It is noted, however, that applicant has not filed a certified copy of the Japanese application as required by 35 U.S.C. 119(b).

### ***Information Disclosure Statement***

The information disclosure statement filed 9/02/02 fails to comply with 37 CFR 1.98(a)(1), which requires a list of all patents, publications, or other information submitted for consideration by the Office. It has been placed in the application file, but the list of information referred to therein has not been received. Correction is required.

### ***Specification***

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Method of Manufacturing A Semiconductor Device With Tensile Stress.

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Brief Description of the Views of the Drawing(s) Figs. 26 & 27 are missing.

Appropriated correction is required.

***Claim Objections***

Claim 20, line 1 is objected to because of the following informalities: --claim 4 or 9--. It is indefinite. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 5 & 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Wilcoxon (U.S. 5,059,556)

Wilcoxon disclose a method for relieving stress in silicon substraste, which include:

-Re. claim 1: wherein a material having stress of not more than  $10^{-9}$   $8 \times 10^9$  power 9/cm<sup>2</sup> is formed in contact with a semiconductor is formed on substrate, whereby an argon impurity element in the semiconductor film is gettered into the material (col. 3, lines 23-34; col. 5, lines 13-17; col. 8, lines 5,6); col.2, lines 62-68 and col. 4 lines 37-41).

-Re. claims 2 & 7: wherein the material is formed by sputtering LPCVD, and within a temperature range of between 500-900 C degrees (col.4, lines 16-46).

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-Re. claim 5: wherein the material is a silicon nitride film formed by LPCVD (col.5, lines 31-45 and col. 7, lines 3-8).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3,4,6,8,9 & 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilcoxon (U.S. 5,059,556) in view of Yonehara et al.(U.S. 5,670,411).

Wilcoxon disclose substantially all of claimed invention, except for the forming LPCVD with chloride gas (cls. 4 & 9); wherein the Cl<sub>2</sub> is a mixture gas of any one of SiCl<sub>4</sub>, SiH<sub>2</sub>Cl<sub>2</sub>, SiCl<sub>3</sub> or Si<sub>2</sub>Cl<sub>6</sub> (cl.20); and the pressure range of LPCVD as well as the ratio of nitride silicon (cls. 3,6 & 8).

Yonehara et al. disclose a process of making a semiconductor device, which include:

Re. claims 4,9 & 20: wherein the material is formed by LPCVD with a gas containing chlorine and is a mixture gas of any one of SiCl<sub>4</sub>, SiH<sub>2</sub>Cl<sub>2</sub>, SiCl<sub>3</sub> or Si<sub>2</sub>Cl<sub>6</sub> (col. 8 & 9, lines 33-2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Wilcoxon 's process by using the gas containing chlorine and the chloride is a mixture gas of SiH<sub>2</sub>Cl<sub>2</sub> in forming the material, to obtain a

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stabilization and better control for the growing of diffusion impurity during heating process, because the impurity determines the built in stencil stress of the material layer.

With respect to claims 3, 6 & 8 the pressure, ratio are considered to involve routine optimization while has been held to be within the level of ordinary skill in the art, As noted In re Aller, the selection of reaction parameters such as temperature and concentration would have been obvious.

"Normally, it is to expected that a change in pressure, temperature, or in range of ratio, concentration, cycles, thickness, would be an unpatentable modification. Under some circumstance, however, changes such as these may be impart patentability to a process if the particular ranges claimed produce a new and unexpected result which is different in kind and not merely degree from the results of the prior art ... such ranges are termed "critical ranges and the applicant has the burden of proving such criticality ... More particularly, where the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation." In re Aller 105 USPQ233, 255 (CCPA 1995). See also In re Waite 77 USPQ 586 (CCPA 1948); In re Scherl 70 USPQ 204 (CCPA 1946); In re Irmischer 66 USPQ 314 (CCPA 1945); In re Norman 66 USPQ 308 USPQ 308 (CCPA 1945); In re Swenson 56 USPQ 372 (CPA 1942); In re Sola 25 USPQ 433 (CCPA 1935); In re Dreyfus 24 USPQ 52 (CCPA 1934).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yennhu B. Huynh whose telephone number is 703-308-6110. The examiner can normally be reached on M-F 8.30AM-7.00PM.


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead, can be reached 703-308-4940. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

YNBH,

10/23/02

  
CARL WHITEHEAD, JR.  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2800